

电力系统

基于磁制动原理的特高压变压器励磁涌流快速识别

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摘要: 针对特高压大容量三相分体变压器差动保护, 提出一种基于磁特性的励磁涌流快速识别新方案, 该方案充分考虑了特高压变压器端部接长距离输电线路的实际特点, 配合自适应数字低通滤波器计算变压器等效瞬时磁阻, 有效解决了内部故障时由于变压器模型简化造成的计算误差问题。根据内部故障和励磁涌流时等效瞬时磁阻的不同变化特征, 能够在10 ms识别出励磁涌流, 同时还考虑了内部故障TA饱和的影响, 能够保证在TA严重饱和情况下做出正确判断。该方案识别速度快、可靠性高、整定方便, 具有广阔的工程应用前景。实验结果验证了其快速性和可靠性。

关键词: 特高压变压器 等效瞬时磁阻 励磁涌流 电流互感器饱和 差动保护

A Novel Scheme Based on Flux Restraint Theory Used in Distinguishing Inrush Currents for UHV Transformers

Abstract: As to differential protection for ultra-high voltage (UHV) three-phase divided tank transformer, this paper provides a novel fast magnetizing inrush currents distinguishing scheme based on magnetizing character. With sufficient consideration to realistic application factor of UHV transformer end connecting with long-distance transmission line, and with corresponding calculation for transformer equivalent instantaneous reluctance using adaptive digital low-pass filter, this scheme is good for solving problems of calculation error rising from transformer model simplification. According to different characteristics in variation during internal fault and magnetizing inrush, it can be accomplished to identify magnetizing inrush in just 10ms, at the same time it also gives the consideration to the influence of TA saturation during internal fault in guarantee of correct judgement even TA is in serious saturation. This scheme is with following virtues including real time response, small calculation workload, high reliability, and promising engineering applications. It is proved its real time capability and reliability through test.

Keywords: ultra-high voltage transformer equivalent instantaneous reluctance inrush current current transformer saturation differential protection

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